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AUTHOR Smith, Linda H.; Renzulli, Joseph S.
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ABSTRACT

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The Assessment and Application of Learning Style Preferences:
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Dr. Linda H. Smith and Dr. Joseph S. Renzulli

This article focuses on an educational versus psychological definition of learning styles and offers a rationale for matching student and teacher style based upon this definition. A survey of various matching approaches is provided along with a classification chart that visually differentiates among alternative matching strategies. The Learning Styles Inventory by Renzulli and Smith is then described. The LSI is a research-based instrument designed to guide teachers in planning learning experiences that take into account the learning style preferences of students within their classrooms. The instrument provides information about student attitude toward lecture, discussion, drill and recitation, peer teaching, simulation, projects, teaching games, independent study and programmed instruction. Finally, research studies related to the LSI are reviewed.

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The Assessment and Application of Learning Style Preferences:

A Practical Approach for Classroom Teachers

Linda H. Smith

Joseph S. Renzulli

Dr. Linda H. Smith
Consultant on Gifted Child Education
3802 St. Paul Street
Baltimore, Maryland 21218
301-467-3721

Dr. Joseph S. Renzulli
Professor of Educational Psychology
University of Connecticut
Storrs Hall Box U-7
Storrs, Connecticut 06268
203-486-4826

> The wide range of individual differences surely must mean that there is no single method for nurturing creativity; ideally the experiences we provide should be tailormade, if not for individual students, at least for different types of students. We should remember that the same fire that melts the butter hardens the egg.
>
> MacKinnon (1978, p. 171)

Whenever recommendations are made for new ways of doing things in the classroom, it is both appropriate and essential to ask the question, Why? Why is it necessary to modify instructional practices based on the "new" concept? Will it enhance our effectiveness as teachers or will it just tie us down with more paperwork? Will it increase our students' learning and motivation or will it simply complicate what might be an otherwise smooth-running instructional program?

In dealing with the concept of matching teaching and learning styles, these questions are of particular interest. We say this because over the past two decades a great deal of progress has been made toward recognizing the varying needs and characteristics of the learner. In fact, the concept of "individualized instruction" has become one of the cornerstones of modern educational practice. As Jeter and Chauvin (1982) note: "Educators are keenly aware that each student possesses unique needs, interests and abilities and that each child should have an opportunity to pursue an effective instructional program at a pace that is challenging and interesting."

Jeter's and Chauvin's observation, while complimentary of today's educators, exposes a very pervasive misconception about individualization. That is, that the concept of individualization, which is based on a vast literature documenting the uniqueness of the individual, can be translated into classroom practice by allowing youngsters to proceed through predefined curriculum at different rates.

To be sure, respecting differences in student learning abilities is a major component of individualization and efforts to allow students to progress through curriculum at their own rate should be commended. It is our contention, however, that if we are to reap the full educational benefits from the concept of individual differences, it will be necessary to respect a wider range of characteristics that make students unique as learners.

Among this wider range of student characteristics (other than abilities) that one could possibly study and evaluate, we believe two stand out as being of paramount importance. The first of these characteristics is student interests, be they personal, topical or occupational. Through the use of interest inventories, questionnaires and informal assessment on the parts of teachers and counselors, efforts can be made to discover the content area(s) in which particular youngsters seem to have special interests. This information can then be used to build into the curriculum a wider array of learning experiences that will have special "drawing power" and will elicit greater commitment and exploration on the parts of students.

The other characteristic that we believe to be of particular importance is learning styles. One of the major assumptions underlying our work is that a well-rounded individualization effort must take into account <u>how</u> the child would like to pursue a particular activity as well as the rate of learning and the child's preference for a certain topic. This is not to say that complete freedom of choice should exist for all educational activities. On the contrary, there are certain basic skill areas that are more appropriately taught through one approach than another. A case in point would be specialized topics in mathematics that might best be taught through lecture or programmed instruction and essentially could not be taught through a simulation or discussion approach.

The current situation in most classroom, however, is that learning style preferences are rarely, if ever, considered in a systematic fashion. We are suggesting that this is a significant oversight. And while we do not recommend that instruction be guided solely by learning style preferences, we believe that teachers should make informed decisions about the areas or units within which style differences can be incorporated.

What Do We Mean By Learning Styles?

In reading through the literature on learning styles, one is immediately struck with the range of definitions that have been adopted to describe this construct. These definitions range from concerns about preferred sensory modalities (e.g., visual, auditory, tactile, etc.) to descriptions of personality characteristics that have implications for behavior patterns in learning situations (e.g., the need for structure versus flexibility). Others have focused attention on cognitive information processing patterns, such as DeCecco's and Crawford's (1974) work on conceptual tempo and selection strategies and Kolb's (1978) work on concrete versus abstract thinking abilities.

Our approach to the assessment and educational use of learning styles was guided by an operational definition that considers learning styles to be the counterpart of teaching styles. That is to say, learning styles are defined in terms of the range of instructional strategies through which students typically pursue the act of learning. The domain of potential teaching strategies is restricted only by the requirements that each teaching style is (1) general enough to apply to a variety of content areas; (2) is a repeatable way of teaching (i.e., can be used on different occasions); and (3) can be employed by teachers without extensive training.

This practical definition was adopted in an effort to remove some of the

mystery that has surrounded the assessment of learning styles. By dealing directly with instructional practices rather than the "psychological middleman" that often characterized discussions of learning styles, we hope to eliminate the need for teachers to "second guess" how certain psychological concepts or characteristics might relate to learning situations. In so doing, we also hope to increase general interest in the concept of learning styles and decrease the time needed to translate research findings into everyday classroom practice.

The Concept of Matching: An Overview

Interest in learning styles has led to a great deal of debate regarding the feasibility and potential benefits of "matching" students to learning environments. A growing body of research addresses the question of how matching affects cognitive outcomes and student satisfaction with different types of educational processes. These studies can be classified into two general types, those that propose to match students with teachers based on personality characteristics and those that focus on various teaching strategies and their appropriateness for different types of students. Each of these groupings can be further divided into two separate subcategories, as depicted in Figure 1.

Looking first to the studies where personality characteristics are matched, it can be seen that in some cases a disparity or discrepancy between teacher and student personality is the vehicle for maximizing student growth. Matching (or mismatching) in these cases can be seen to involve placing students with particular characteristics in classrooms with teachers who are likely to modify these characteristics. It has been found, for example, that when impulsive children are placed with reflective teachers, children can become more reflective in their thinking (Kagan, 1966). Similarly, Hunt (1971) found that teachers who operate at a somewhat more abstract level on an abstract-concrete continuum can increase students' level of conceptual complexity.

It is important to note that purposeful mismatching should be carried out with the utmost of care and caution. Both research and classroom practice has shown that harmful effects can result when students and teachers are required to perform over extended periods of time in environments that are inconsistent with their style "preferences." Stress, frustration and even burnout have been attributed to this situation (PAR, 1980).

Another approach to matching individual differences in both teachers and students is to maximize the congruence or similarity of personality characteristics. This approach is based on the principle that the more similar two people are on a given variable, the more likely they are to be attracted to one another. At the very least, this attraction can be expected to result in improved classroom climate. A review of studies examining this approach to matching reveals inconsistent findings. For example, Thelen (1967) reported that in classes where teachers and students were matched, more "manageable" classes resulted, students received higher grades and were generally more satisfied with classroom activities. Jones (1971), on the other hand, found that matching teachers and students on introversion-extroversion characteristics seemed to make little difference in the frequency or nature of student-teacher dyadic interactions. Similarly, McDonald (1972) found that mutual attraction between teachers and students did not seem to affect classroom interaction patterns.

An alternative approach that has been examined involves matching students to differing instructional strategies, rather than to teachers with particular personality characteristics. This approach is based on the contention that students are differentially susceptible to educational environments and that learning will be maximized when the appropriate form of instruction is matched to the individual student. Studies falling within this second major category can be divided into two general types: those that deal with increasing congruence between students and teaching styles by examining the personality characteristics of students and those that attempt to enhance congruence by allowing students to select instructional

methodologies on the basis of their own perceived needs, goals or preferences.

Studies that deal with matching instructional methods to learner characteristics fall within the domain of Aptitude-Treatment Interaction (ATI) research. These studies differ from traditional research that examines the relative effectiveness of teaching methods in that they incorporate into their design one or more individual difference variables. The inclusion of these data enable the investigator to examine which method is most effective for a particular individual (or type of individual) rather than for the "average" student in the class. One might study, for example, how students with differing levels of manifest anxiety perform in structured versus unstructured classrooms or how students' achievement orientation interacts with various teaching methods.

While some studies falling within this category reveal a significant and predictable relationship between student personality and teaching method, ATI research in general has been somewhat disappointing. Only a small percentage of the studies carried out over the past two decades of ATI research have found teaching methods to be differentially effective for students with differing characteristics. This is not to say that differences do not exist. It could be that key characteristics have yet to be uncovered or that experimental interventions alter preexisting relationships. It is also possible that Hunt (1975) is correct in saying that pessimistic conclusions about ATI have all stemmed from a very narrow definition of person-environment interaction. In any event, there is yet another matching approach to be explored and this approach has more consistently produced encouraging results.

This final approach to matching and the one directly related to our work involves having students examine their own needs and goals and providing teaching styles based on their stated preferences. Farr's (1971) research on the ability of students to predict their more effective learning modality, along with the studies by Domino (1971) and Vinton (1972) lend support to the possibility that students can predict their own learning style. Studies by James (1962), Pascal

(1971) and Smith (1976) also provide support to a student-based approach to learning style matching. These studies found that there was a significant difference in student achievement and/or attitude toward subject matter when students were allowed to learn in their preferred mode of instruction. In other words, educational outcomes were enhanced by giving students the opportunity to evaluate their learning style preferences and by "delivering" instruction that was consistent with these assessments.

Findings of this nature are so simple and straightforward that they can be easily overlooked or ignored. Yet the implications for classroom practice and learning in general are significant. Documentation to date suggests that learners' attitude toward instructional style can affect their openness and responsiveness to content being taught. It may be that giving students the opportunity to pursue topics in a self-chosen fashion increases their "investment" in the learning material being prescribed. That is to say, students may become more involved in learning what has to be learned if we offer choices in how information or skills can be acquired.

It is also possible that matching teaching methods to learning style preferences helps eliminate barriors to learning which arise when we fail to address the affective responses various teaching modalities elicit from students. It seems quite obvious that depending on the teaching approach being used, different demands are placed on students and different skills are required to perform successfully. Lecture, for example, is a relatively structured form of instruction with communication flowing primarily in one direction -- from the teacher to the student. Students are required to listen to information and ideas that have been organized and sequenced for them. There is very little initiative or choice-making required. Independent study, on the other hand, calls for an entirely different set of behaviors on the parts of students. This style of learning is characterized by freedom from constant supervision and by individual or small group decision-making. Typically, students are

required to choose an area of study, develop an approach to gathering information, synthesize findings and produce some kind of an outcome, such as an oral presentation or a written report.

If differences among teaching modalities are as noteworthy as we are suggesting, it is not hard to imagine why some students find independent study anxiety-producing even when skills for pursuing independent work have been introduced. These same students, however, may find a discussion or lecture approach thoroughly satisfying. Likewise, certain students may respond favorably to a peer-teaching arrangement whereas others would opt for a projects or programmed instruction approach to learning and demonstrating proficiency in various subject areas.

Once again, this is not to say that we need to accommodate learning style preferences on all occasions for all students. Indeed, there are times when it is important to introduce alternative learning style approaches or to decide which approach will most efficiently transmit information to be covered. What we <u>are</u> saying is that learning style preferences vary among individuals and that efforts should be made to (1) understand these differences and (2) alter instructional style in those areas and at those times that modifications are possible.

The Learning Styles Inventory: A Measure of Student Preference for Instructional Techniques

It was our interest in learning style preferences that led to the development of the <u>Learning Styles Inventory</u> (LSI, Renzulli & Smith, 1978). The LSI is a research-based instrument that was designed to guide teachers in planning learning experiences that take into account the learning style preferences of students within their classrooms. The instrument consists of 65 items that provide information about student attitude toward lecture, projects, drill and recitation, peer teaching, discussion, teaching games, independent study, simulation and programmed instruction. Students are asked to read the items carefully and respond in terms of how pleasant they find participating in each type of learning experience. The directions emphasize

that the LSI is not a test in the traditional sense of the term but rather seeks to identify the ways in which individual children would like to pursue varous types of educational experiences. Students are told that there are no "right" or "wrong" answers and that the information gained from the LSI will be used to help plan future classroom activities.

One of the unique components of this instrument is the teacher form that accompanies each set of student materials. This form is designed as a tool for teachers to look at the range of instructional strategies used in their classrooms. The profile of instructional styles resulting from this procedure can be compared to individual student preferences and can serve to facilitate a closer match between how teachers instruct and the styles to which students respond most favorably.

All LSI forms are prepared on optical scanning sheets and are scored by computer. Computer analysis results in a variety of reports, an overview of which is provided below.

Scores for Individual Students. The first analysis on the computer printout contains each student's raw score on the nine learning style dimensions assessed by the LSI. These scores range from 1.00 to 5.00 with a 1.0 indicating a strong negative attitude toward a given learning style dimension and a 5.00 indicating a strong preference for a particular style.

Learning Style Preferences of Individual Students. The second analysis lists the learning style dimensions on which each student received their two highest and two lowest scores. This analysis serves as a "quick summary sheet" which highlights students attitudes toward various teaching modalities.

Students Who Find Each Approach in the Pleasant Range. This analysis identifies groups of students whose scores on each of the learning style dimensions is in the pleasant range. In essence, this analysis is a "grouping report" which program planners can refer to when attempting to accommodate learning style differences in individual or small group situations.

Students Who Find Each Approach in the Unpleasant Range. This analysis groups

students together whose learning style scores indicate that they find each approach in the "unpleasant" range. These results can give teachers an insight into which styles should be deemphasized with particular students or, if they are valued learning modalities (such as independent study or projects), which styles should be introduced in a creative fashion in order to expand the styles to which individual students respond favorably.

Profile of Learning Style Preferences. The fifth analysis provides a series of graphs that visually display each student's profile of learning style preferences. These profiles can be compared to the teacher's profile of instructional techniques (see below) and can serve to facilitate a closer match between strategies that teachers use in the classroom and the approaches to which students respond most favorably.

Class Profile of Learning Style Preferences. The final analysis consists of two graphs. The first of these graphs, the Class Profile of Learning Style Preferences, visually presents the class average for each learning style dimension. This profile provides insights into the general nature of a given class' learning preferences.

Profile of Teaching Styles. The final graph is a profile of the teacher's instructional styles. These results should be examined closely by teachers to determine the degree to which "favored" strategies accommodate individual learning style preferences.

Using the LSI: Some Research Results

The initial study into the effectiveness of the LSI was carried out by Smith (1976). In addition to reporting validity and reliability data, this study examined the relationship of learning style matching to student achievement, motivation and interest in subject matter, as well as the relationship between traditional measures of school success and specific achievement, motivation and interest. Overall, the results of this study confirmed the fact that learing style matching significantly enhances educational outcomes. Students who were taught by their preferred method

achieved better, were more interested in the subject matter, liked the way the subject was taught and wanted to learn other school subjects in the same way. Motivation was not significantly different for matched versus unmatched students. It should be noted that the learning style variable also explained a significant portion of the variation in achievement and interest that was unaccounted for by such traditional predictors of school success as IQ and prior achievement. What is particularly important about this observation is that learning style matching can be manipulated while IQ and prior achievement are generally beyond the control of individual classroom teachers.

Other findings with regard to the LSI are reported by Stewart (1979) and Wasson (1980). Stewart investigated the difference in preferred learning style between gifted students and students in the general population. Results indicated that gifted students differ significantly from students in the general population, with Lecture, Independent Study, Discussion and Projects contributing most to the differences between the two groups. Lecture showed the greatest variation, with students in the general population showing a stronger preference for this style of instruction than did gifted students. Stewart also found that grade level, sex, locus of control and favorite subject significantly affect learning style preferences. Based on these findings, it was concluded that gifted students tend to prefer instructional methods that emphasize independence while students in the general population prefer instructional methods with somewhat more structure. It was also concluded that while many factors influence learning style preferences, the assessment of learning style appears necessary for planning appropriate educational programs for various subgroups of students.

Wasson's (1980) research on the LSI revealed that gifted students ranked last those instructional styles that rely on the auditory modality, i.e., Drill and Recitation, Lecture and Discussion. The most preferred instructional strategies of gifted youngsters were Teaching Games and Independent Study. This finding confirms the results reported by Stewart (1979), who also found that

Teaching Games and Projects were the learning styles most preferred by students in the general population.

Conclusions

We began this article by asking the question, Why? Why is it important to consider learning styles when planning educational programs? In answering this question, we will highlight some of the points we have presented.

1. It is now widely accepted that differences in student learning styles do in fact exist. Although definitions of learning style may vary, findings have shown that there are clear-cut and systematic differences in learning style preferences within any given classroom of students.

2. Research has shown that learning style matching can and does have a positive impact on student achievement, interest and/or motivation. This finding confirms what many experienced teachers have long believed -- that students learn best when the style as well as the pace of instruction is varied within the classroom. Even prior to the availability of research on this topic, Torrance (1965) pointed out that "...alert teachers have always been aware of the fact that when they change their method of teaching, certain children who had appeared to be slow learners or even non-learners become outstanding achievers" (p. 253).

3. There are now a variety of instruments available to help teachers identify students' learning style preferences. These measures are useful because they enable teachers to assess a large number of students in a relatively short period of time. Given the many demands placed on classroom teachers today, a group assessment device of this sort increases the likelihood that learning style information will be obtained and at some point incorporated into instructional programs for different groups of students. Learning style measures also have the advantage of providing teachers with objective data. This information can be used to supplement one's intuitive understanding of students and can provide insights into learning style dimensions that may not have been previously considered.

4. Despite years of searching for the definitive teaching approach, educators have come to realize that there is, in fact, no such entity. Every technique has its advantages and disadvantages and will be differentially effective depending on many factors, including the topic being addressed and the students being taught. For this reason, Joyce and Hodges (1966) suggest that "a teacher who can purposefully exhibit a wide range of teaching styles is potentially able to accomplish more than a teacher whose repertoire is relatively limited." Improving the quality of instruction may thus be tied to increasing the variety of instructional techniques used in the classroom. Learning styles assessment can help teachers direct their attention to the strategies that are most effective with either individuals or small groups of students.

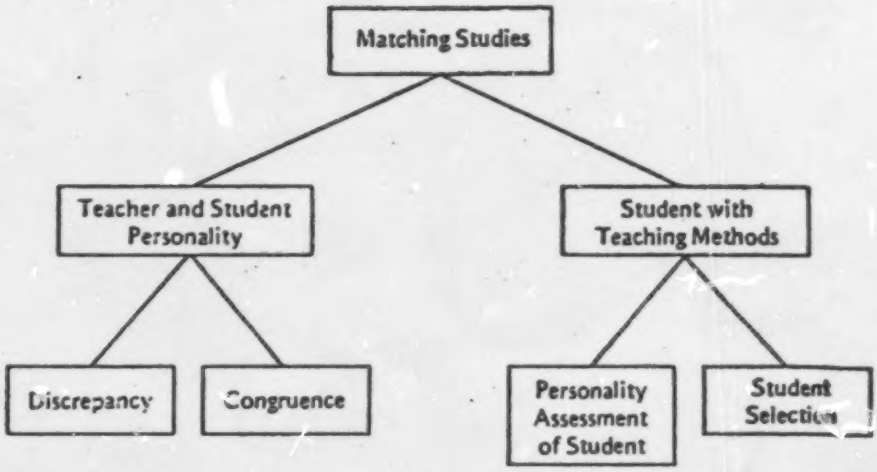

Figure 1. Classification of Matching Studies

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